

**METHOD FOR FORMING A SEMICONDUCTOR DEVICE WITH LOCAL
SEMICONDUCTOR-ON-INSULATOR (SOI)**

Abstract of the Disclosure

5 A semiconductor on insulator transistor is formed beginning with a bulk silicon substrate. An active region is defined in the substrate and an oxygen-rich silicon layer that is monocrystalline is formed on a top surface of the active region. On this oxygen-rich silicon layer is grown an epitaxial layer of silicon. After formation of the epitaxial layer of silicon, the oxygen-rich silicon layer is converted to silicon oxide while at least a portion of the
10 epitaxial layer of silicon remains as monocrystalline silicon. This is achieved by applying high temperature water vapor to the epitaxial layer. The result is a silicon on insulator structure useful for making a transistor in which the gate dielectric is on the remaining monocrystalline silicon, the gate is on the gate dielectric, and the channel is in the remaining monocrystalline silicon under the gate.

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